

NOTES ON THE AUSTRALASIAN SPECIES OF *CYMATIA* FLOR S.L. (INSECTA, HETEROPTERA: CORIXIDAE)

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Summary

LANSBURY, I. (1983) Notes on the Australasian species of *Cymatia* Flor s.l. (Insecta, Heteroptera: Corixidae). *Trans. R. Soc. S. Aust.* 107(1), 51-57, 31 May, 1983.

The validity of generically distinguishing the Australasian *Cymatia* from the rest of this primarily holarctic genus is discussed. *Cnethocymatia* Jansson, 1982 proposed for *Cy. nigra* is relegated to subgeneric status within *Cymatia*. *Cymatia nigra* and the anomalous Asian species *Cy. apparens* are both compared with the remainder of the known species.

KEY WORDS: Corixidae, *Cymatia nigra*, Australasia, *Cnethocymatia*, *Cymatia apparens*, holarctic.

Introduction

Five genera of Corixidae occur in Australia, *Diaprepocoris*, *Micronecta*, *Agriptocorixa*, *Sigara* and *Cymatia* (*Cnethocymatia*). Hungerford (1947) added *Cymatia*, the least known, when he described *Cy. nigra* based on a single female specimen from Prince of Wales Island. The type is in the Snow Entomological Collections, Lawrence, Kansas. The presence of the genus remained an enigma in Australia until 1979 when I collected a small series from pools in the Julatten area of North Queensland. Subsequently a male specimen from Iron Range, Cape York Peninsula was located in the Dept. of Entomology, University of Queensland. Jansson (1982) studying *Cy. nigra* from New Guinea erected a new genus *Cnethocymatia* for Hungerford's species.

Generic concepts

Jansson's reinterpretation of *Cymatia* and its division draws attention to the problems of subfamily/tribal classification in the Corixidae (Corixinae). *Cymatia* has at various times been accorded subfamily or tribal status. Walton in Hutchinson (1940) placed the genus in the Corixinae—Cymatiini trib. nov. Walton (1943) expanded his comments on the classification of the Corixidae but these observations were criticised by Hungerford (1948). China (1943) placed *Cymatia* in the Cymatiinae without comment. Hungerford's (1948) review of the Corixidae increased the number of subfamilies to six describing the Cymatiinae as a new subfamily without reference to China's (1943) usage. Both authors included

only one genus, *Cymatia* (type species *coleoptrata* (F.)).

Leston (1955) summarised and tabulated the previous classifications of the Corixinae and relegated Cymatiinae to tribal status. Popov (1971) gave cogent reasons for including *Cymatia* in the Corixinae in a classification which included fossil forms. Jansson (1982) follows Hungerford *et al* in treating *Cymatia* and *Cnethocymatia* as belonging to a separate subfamily. Jaczewski (1964) reviewed *Cymatia* and regarded the genus as the most archaic (plesiomorphic) of all the Corixinae. Features to which Jaczewski drew attention included: short claws of middle legs, absence of "pala" pegs, no strigil and the lack of pronounced asymmetry of the male abdomen. Jaczewski arranged the species in two groups. With the exception of *Cy. nigra* and *Cy. apparens* (Distant) the remaining species are all remarkably uniform in structural features.

Definition of *Cymatia* Flor 1860 s.l.

Rostrum smooth without transverse sulcations. Front tarsus (pala) elongate, cylindrical with negligible palms. Male pala with a broad thickened claw (Fig. 10), female much like the male but with spine in place of thickened claw.

In most of the Corixinae there are considerable differences between the male and female palae, with those of the male having one or more rows of stout pegs on the face of the pala (Lansbury, 1970). Features cited by Hungerford (1948: p. 99) which call for comment include the presence of a nodal furrow in *Cymatia*. He states "the median vein appearing to curve abruptly downwards to

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costal margin without making contact with cubitus. The location and direction of this curved portion of media suggests a nodal furrow. There is however, no indication of a cleavage plane which is characteristic of a nodal furrow". Partial maceration of a hemelytron (Fig. 4) seems to show a vestigial nodal furrow, but it is almost certainly an artifact.

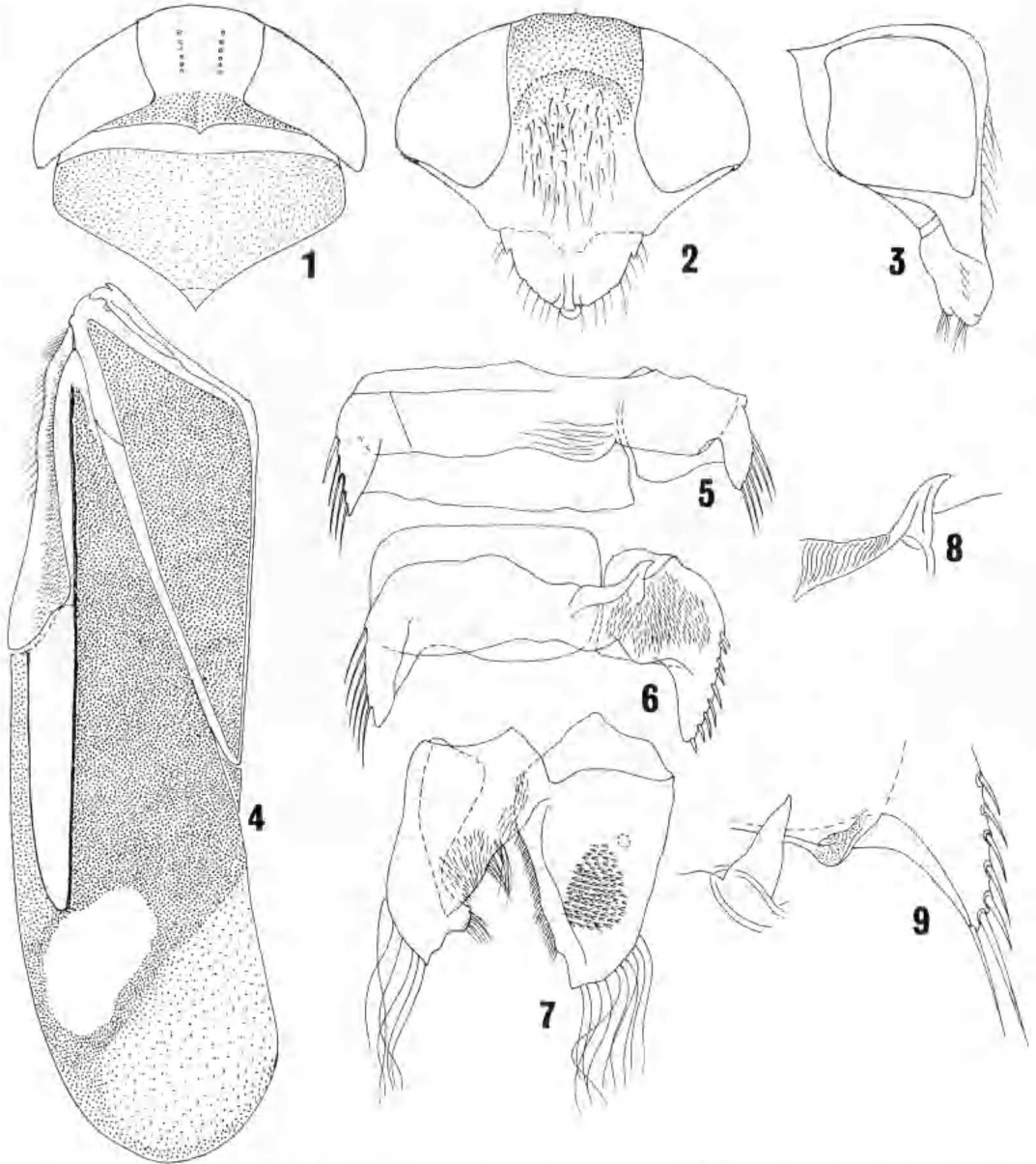
Cymatia species and their distribution

Cymatia coleoprata (F.), widely distributed euro-Asian element including North Africa.

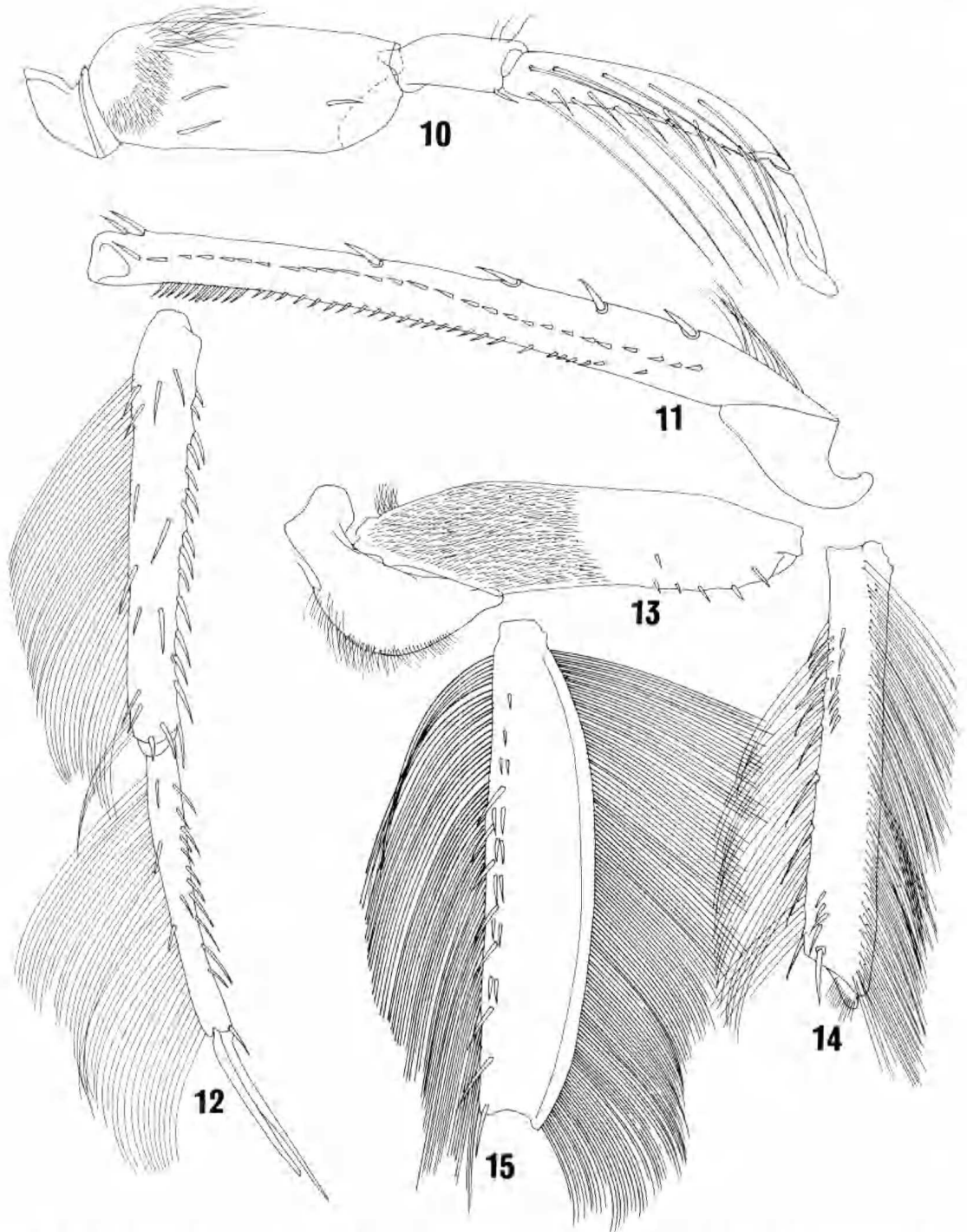
Cy. bondsdorffi (C. Sahlberg), Europe and part of Western Asia.

Cy. rogenhoferi (Fieber), temperate Europe through to Hindu Kush and North Africa.

Cy. apparens (Distant), temperate China, Tibet, Kashmir, India and Japan.



Figs 1-9. *Cymatia nigra*, male. 1, dorsal view of head and pronotum; 2, frontal view of head; 3, lateral view of head; 4, hemelytra; 5, 6th tergite; 6, 7th tergite; 7, 8th tergite; 8 & 9, detail of 6th and 7th tergites.



Figs 10–15. *Cymatia nigra*, male. 10, front leg; 11, middle femur; 12, middle tibia, tarsi and claws; 13, hind femur; 14, hind tibia; 15, 1st hind tarsus.

Cy. americana Hussey, Alaska, Canada and the continental U.S.A.

Cy. nigra Hungerford, Prince of Wales Island, North Queensland, Papua New Guinea and N.W. Irian.

(from Jaczewski and others).

Cymatia (*Cnethocymatia*) *nigra* Hungerford
FIGS 1-23

Cymatia nigra Hungerford, 1974. *J. Kansas Entomol. Soc.* 20, 154-157.

Cnethocymatia nigra: Jansson, 1982. *Pacific Insects* 24, 95-98.

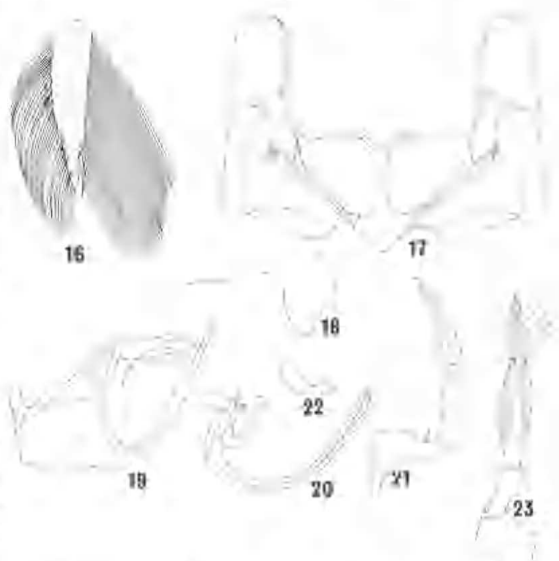
Description: (based on male, 5 mm long (alcohol specimen)).

Colour: head orange yellow with posterior margin between and behind eyes dark brown to black (Figs 1 & 2). Pronotum and hemelytra uniformly shining dark chocolate brown other than distal outer margin of corium which has bright yellow spot, left membrane pale yellow (Fig. 4). Right membrane same colour as elytra. Embolium, sternum and legs dark brown.

Structurally *Cy. nigra* resembles a generalised *Cymatia*, a number of characters set *Cy. nigra* apart from the rest of the genus: non-carinate pronotum (Fig. 1); more or less unicolorous pronotum and elytra (Fig. 4); sclerotised ridge on the 6th tergite (Figs 5 & 9); prominent projection on the 7th tergite (Figs 6, 8 & 9); group of stout setae on 8th lateral lobe (Fig. 7); left lobe of 8th sternite infolded (Fig. 7).

Male fovea not prominent and only moderately pilose (Figs 2 & 3). Tergites 6-8 each bear specialisations not found on other species (see above). Front leg typical (Fig. 10). Middle legs longer than hind legs and have conspicuous but not dense fringe hairs (Figs 11 & 12), the function of which is not clear, possibly grooming and cleaning. Hind tibia bear several rows of long hairs which probably have a similar function (Fig. 14). Tarsi have long dense fringes of swimming hairs (Figs 15 & 16). (longer and denser than shown in the figures). Metaxyphus and scent gland osteoles (Fig. 17). Lateral lobe of prothorax (pronotum) (Fig. 18). Antennae four segmented (Fig. 23).

Male genitalia: genital capsule asymmetrical, slightly deeper dorso-ventrally than long (Fig. 19). Rim of "dorsal" opening heavily sclerotised. Posterior diverticulum continuous with and extending into capsule ventrally where attached to sclerotised plates aris-



Figs 16-23. *Cymatia nigra*, male. 16, 2nd hind tarsus; 17, osteole and metaxyphus; 18, lateral lobe of prothorax; 19, genital capsule; 20, aedeagus; 21, left paramere; 22, right paramere; 23, antennae.

ing from "floor" of capsule. Diverticulum not symmetrical with capsule, more broadly attached to right margin and narrowly so to left margin of capsule. Left paramere (Fig. 21) large, lateral margins infolded; together with curved lateral margins of diverticulum. Strongly sclerotised "half-moon" shaped support provided for aedeagus (Fig. 20). Bias to right of diverticulum allows sufficient space for left paramere. At visible base of left paramere post-capsule, large curved projection overlying aedeagus. Right paramere small and membranous, attached to basal plate and inner wall of capsule (Figs 20 & 22). When right paramere in position with diverticulum and left paramere, forms a "T" junction with projection on latter.

The asymmetry of the genital capsule of *Cy. nigra* is more pronounced than that of *Cy. apparens* (Fig. 24); the capsules of *Cy. honsdorffi* and *Cy. coleoprata* are much less sclerotised than those of *Cy. nigra* and *Cy. apparens*. Hungerford (1948) figures the capsule of *Cy. americana* without comment.

Distribution: Queensland, Julatten, 20.v.1979, water-lily lagoon, permanent pool with plenty of macrophytes, water clear, substrate silty; 1 male 2 female and 1 immature *Cy. nigra*. In the same habitat, *Sigara tadeuzi*, *Agraptocorixa eurynome*, *Enithares loria*, *Anisops*

tahitiensis, *Limnogonus fossarum skuei* and *Diplonychus eques*.

Queensland, Julatten, 20.v.1979, small pool shaded by bamboo, bottom covered with bamboo leaves; 1 male *Cy. nigra*. In the same habitat, *Agratocorixa halei*, *Anisops elstoni* and *Ranatra diminuta*. Queensland, Iron Ranges, Cape York Peninsula, 16-623.xi.1965, G. Monteith; 1 male (University of Queensland).

Jansson (1982) records *Cy. nigra* from various localities in New Guinea, most of the material having been taken at light.

Within Australia *Cy. nigra* appears to be limited to Northern Queensland. Present data give few clues of habitat preferred other than the immature found at Julatten. Other pools in the area i.e. farm dams with and without vegetation and rain forest creeks had fairly diverse faunas but *Cy. nigra* was not found.

Discussion

Jansson (1982) concluded after studying *Cy. nigra* from New Guinea that Hungerford (1947) had been too conservative in placing *Cy. nigra* in *Cymatia* and erected the genus *Cneithocymatia* for *Cy. nigra*. In a simple key Jansson separated *Cneithocymatia* from *Cymatia* because the pronotum is not carinate and the male has a "finger-like" projection on the 7th tergite. Jansson's broader generic description includes face reduced, rostrum without transverse sulcations, palae elongate cylindrical etc. . . . All these characters apply equally well to *Cymatia*, only the smooth pronotum and projection on the male 7th tergite distinguish *Cy. nigra* from the rest of the genus. Placing *Cy. nigra* in a separate genus is an attractive proposition as it removes the

Australasian species from what is otherwise an entirely holarctic genus. Jansson (1982) states that the finger-like projection on the 7th tergite is analogous with the strigil of many Corixidae (Corixinae). He contends it cannot be homologous with the strigil as it is on the 7th segment, not the 6th which is where the strigil invariably is, if present. The two males of *Cy. nigra* I examined have a thickened sclerotised area on the 6th tergite where the strigil would be if it were present (Figs 5 & 9). The finger-like projection may act as Jansson suggests as a method of attaching male to female during pairing, but the function of the sclerotised ridge on the 6th segment is unknown. As the finger-like projection could overlap the sclerotised ridge, the latter may also have an epigamic function.

Cymatia nigra differs from the other species in a variety of male primary and secondary sexual characters and some colour features (Table 1); in females the only obvious distinction is the smooth pronotum and colouration. Because of the necessity to use tribal/family characters to define *Cneithocymatia*, it is relegated subgeneric status within *Cymatia* (type species *nigra*).

Cymatia apparens (Distant)

FIGS 24-30

Corixa apparens Distant, 1910. Fauna British India, Heteroptera Appendix Vol. 5:343 fig. 204.

Cymatia apparens is not as well known as the other holarctic species. Jaczewski (1928) showed that *Cy. apparens* belonged to *Cymatia* not *Corixa*. Besides Calcutta (type locality) he mentioned its presence in Chikkaballapura, S. India and Schantung Province, Yenchowful,

TABLE 1. Comparison of *Cymatia nigra* with other species of *Cymatia*.

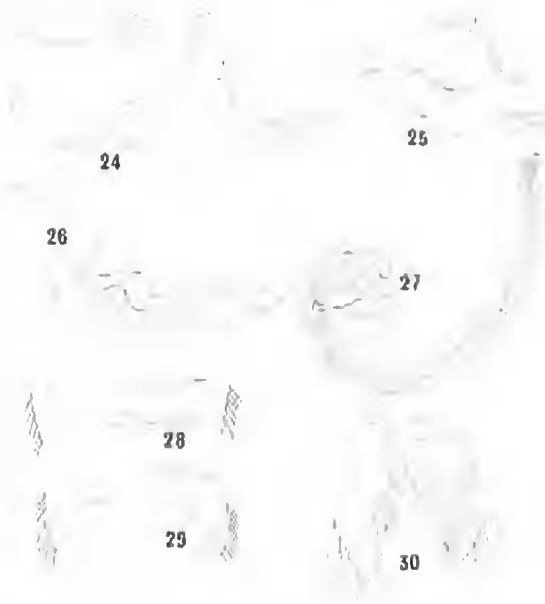
	Pronotum variably carinate	Pronotum unicolorous	Clavus/corium variously striped light-dark brown	Vertex between eyes strongly protuberant	Right posterior margin of ♂ 6th tergite sclerotised (Fig. 9)	Finger-like projection on ♂ 7th tergite (Figs 8 & 9)	Left lobe of ♂ 8th sternite infolded (Fig. 7)	Right lobe of ♂ 8th tergite spinose (Fig. 7)
<i>Cymatia nigra</i>	-	+	-	-	+	+	+	+
<i>Cymatia apparens</i>	+	-	+	-	-	-	-	-
<i>Cymatia coleoptrata</i>	+	-	+	+	-	-	-	-
<i>Cymatia rogenhoferi</i>	+	-	+	+	-	-	-	-
<i>Cymatia bonsdorffi</i>	+	-	+	+	-	-	-	-
<i>Cymatia americana</i>	+	+	+	+	-	-	-	-

China, Lundblad (1933) gave a short resumé of previous accounts and recorded *Cy. apparens* from Peking. Hungerford (1947 & 1948) included *Cy. apparens* in keys to *Cymatia* species. Although *Cy. apparens* is the nearest geographically to *Cy. nigra*, it differs not only from the Australasian species but from the rest of the genus.

The distribution of *Cy. apparens* suggests that it is a 'plastic' species occurring as it does in the tropics (Calcutta) and Tibet-Japan, being tolerant of extreme conditions or possibly more than one species is included under the name.

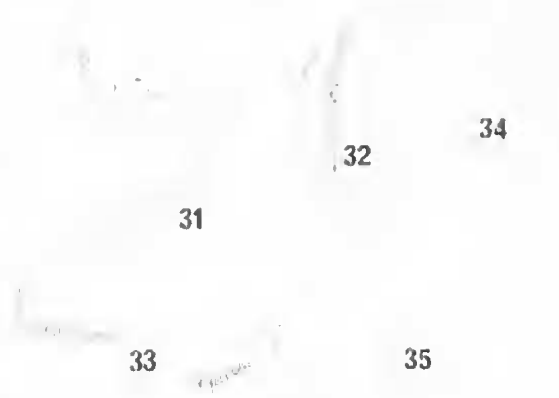
Discussion

Cymatia s.l. is a homogenous group, although not applicable to the Australian Corixinae genera, *Sigara*, *Agraptocorixia* and *Cymatia*; the limits of many Corixinae genera are rather diffuse, few being as well defined as *Cymatia*. Excluding *Cy. nigra*, *Cy. apparens* is the most atypical tending to resemble a generalised *Sigara*. Of the other *Cymatia* species, *Cy. honsdorffi* has a prominent lobe on the 4th tergite (Fig. 33). The general structure of the male genitalia of *Cy. honsdorffi* and *Cy. coleoptrata* (Figs 31-33 & 34-35) respectively are typical *Cymatia*. All the males have similar parameres, the left being large and spinose on the outer margin, variously blunt or acuminate apically. The left paramere is a little more variable; that of *Cy. honsdorffi* is fairly large, likewise that of *Cy. americana* (see Hungerford, 1948). Those of *Cy. nigra*, *Cy. apparens* and *Cy. coleoptrata* (Figs 22, 24 & 35) respectively are small and membranous. According to Hungerford (1947) *Cy. rogenhoferi* does not have a right paramere; Posson (1957) states that it has a vestigial right paramere. In most Corixinae genera the left and right parameres are prominent sclerotised structures.



Figs 24-30. *Cymatia apparens*, male. 24, genital capsule; 25, oblique view of diverticulum and right paramere; 26, left paramere; 27, aedeagus; 28-30, 6th-8th tergites.

The fovea in both sexes is practically obsolete and the pronotum and elytra are *Sigara*-like being arranged in irregular transverse and longitudinal light and dark bands respectively. Distant (1910) described the pronotum as unicolorous pitchy brown overlooking the faint transverse bands on the pronotum. Tergites 6-8 (Figs 28-30) do not have any of the structures found on *Cy. nigra*. The genital capsule (Fig. 24) is like that of *Cy. nigra*. The diverticulum (Figs 24 & 25) is more robust with parameres (Figs 25 & 26) similar to *Cy. nigra*. The left paramere is figured showing inner aspect and curved projection near its base (Fig. 26) and the right paramere shown attached to the capsule. The 8th abdominal segment has the more usual over-lap on both surfaces, the left lobe not being infolded (Fig. 30).



Figs 31-35. *Cymatia honsdorffi* 31-33, *Cy. coleoptrata* 34-35. 31, diverticulum and right paramere; 32, left paramere; 33, 4th tergite; 34, left paramere; 35, right paramere (all male specimens).

Unlike most of the Corixinae, it is known that some at least of the *Cymatia* species are predacious rather than filter feeders. The elongate cylindrical front legs of both sexes are used to grasp prey. With the exception of *Cy. nigra* and *Cy. apparens* the remaining species have very pronounced broad rounded grooves on the front of the head (fovea). The prey is held in the groove. The general feeding behaviour of *Cy. honsdorffi* and *Cy. coleoptrata* has been observed by me. Both species are found most abundantly in water 1 m or more deep with dense stands of submerged macrophytes or rocks presenting vertical faces over-looking clear water. The *Cymatia* cling to

the vertical surfaces and actively seek prey which includes other corixids, water fleas, chironomids and mayfly larvae.

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